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AUTHOR Reed, Lester W., Jr.
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ABSTRACT

An occupational/technical program needs assessment model is described by which colleges can alter existing programs or develop new ones in anticipation of job market requirements. The report first discusses the two-part (existing and potential programs), tri-level (initial evaluation, individual program screening, and individual program planning), hierarchical structure of the model. The data requirements of the model and the sources of these data are then outlined under five categories: manpower demand, manpower supply, student interests, and student and institutional economic interests. The report then outlines criteria for evaluation of the data categories and provides forms which can help individual institutions judge the appropriateness of each category to their particular needs. The appendix includes: (1) a literature review on information and decision theory and its relation to needs assessment; (2) a program vs. Dictionary of Occupational Titles job inventory; (3) employers' program needs, community survey, and student interest questionnaires; (4) job order accounting forms; (5) a format by which graduate follow-up data reveals local supply and demand experience; (6) a format for student cost benefit analysis; (7) state supply vs. demand projections; and (8) program enrollment data forms. (JP)

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OCCUPATIONAL-TECHNICAL PROGRAM

NEED ASSESSMENT MODEL

BY: Lester W. Reed, Jr.
Community College Leadership Program
College of Education
The University of Texas at Austin

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INTRODUCTION

In 1953, James Eddy, Dean of the Division of Extension, The University of Texas stated:

> As education becomes more specific, more and more information and data concerning the areas it is to serve is required. Vocational education, unlike general education, cannot be based upon broad general objectives, but must be based on specific objectives derived from detailed information gained from community occupational surveys. The degree of effectiveness of the vocational program in preparing boys and girls to enter the economic life of their community will be directly related to the use made of information and data gained from such surveys.[1]

Thirteen years later a conference held at the University of Wisconsin on the subject of occupational data requirements for educational planning resulted in a conclusion that:

> Certain points seem clearly established regarding occupational education and the schools. Some occupational data are not collected or not analyzed, some are not available generally, some look only at the past, rather than the future, and the use of data is even rarer than their availability.[2]

Finally, some twenty-three years later, a review of the State Advisory Councils on Vocational Education reports for 1975 concluded:

> Few Councils expressed any real sense of satisfaction with the present quality or general availability labor market supply and demand data for planning, management, or evaluation of vocational programs. The data collection and supply mechanisms generally available are usually embryonic at best, yet many councils comment on the importance of such data systems. . . . In particular, the relationship

> between this data and program development is emphasized. For example, Kentucky asserts the development of a sound reliable and timely data based at the local level is critical for decision-making that will achieve goals such as relevancy and accountability. Most councils commenting on the issue focus their concerns on the gap between what is needed and what is available. . . .[3]

A quarter of a century has passed and the issue of information needed to support decisions on occupational education is still on center stage. The information puzzle had not been solved, and if anything the need to solve it had become more acute. In 1950, 3.4 million Americans were involved in some form of occupational training supported totally or in-part by public funds. By 1977, this figure had risen to 16.5 million students and was costing $5 billion in public funds.[4] If, as implied by the report of the Vocational Education Councils, this training is not assuredly relevant to the job market, the cost not only in wasted tax dollars but in human resources may be staggering.

The purpose of this paper is to provide practicing administrators in community and junior colleges a flexible and pragmatic method of assuring the need for their occupational-technical training. In this way it is anticipated that the occupational education these institutions provide will be more relevant to the job market and to the needs of the student.

The procedure used to establish the requirement for such occupational training is generally referred to by educational administrators as a "need assessment." The key to the process of

effective need assessment is rooted in the comments quoted above. All express a concern about obtaining appropriate information or data on which to base decisions. The process of obtaining these data essentially has to be efficient as well as effective by routinely obtaining and processing the minimum data required to reach rational, accurate decisions.

The theoretical basis of the model presented in this paper will not be discussed since it is not directly relevant to its use. It is sufficient to state that the theoretical concepts involve the process of converting data to information during a sequence of activities related to making a decision. A discussion of the theoretical literature and an abbreviated bibliography is included as an appendix for readers who wish to explore the concepts of information processing and structural decision-making. Also included in the appendix is a discussion of the literature concerning current need assessment practices and its relationship to the information-decision process which support the model presented in this paper.

The Need Assessment Model

The process of an institutional occupational-technical educational needs assessment can be viewed as determining the difference between what should be and what is (or will be). Specifically, it is a system of projecting the future need for trained

manpower versus the supply of manpower and for structuring and adjusting training programs to redress any imbalances. Ideally, a needs assessment would allow an institution to definitively answer the question: "To what extent is this training program needed?" Practically, needs assessments shed some light on the issue and allow for an informed judgmental decision -- it never is absolute.

Needs can be generally viewed as existing in two settings: (1) existing objectives not fully met and (2) opportunities not being used. This approach translates, in the technical education area, into looking at needs for existing programs or determining needs for new programs. Although there is some degree of commonality between the two, each has unique characteristics and sources of data. In common, both try to determine if program graduates can get a job in their area of training, if the job is economically beneficial in terms of student costs, if institutional costs are realistic, and if students are interested in the training. However, existing programs can draw on a pool of internal institutional data generated as a result of the program operation and, in part, must deal with the inherent resistance to change created by their very existence. New program needs rest basically on external data and must deal with the requirement for resources to "start up and continue" the program.

The model presented in this document recognized the two types of need assessments. It proposes various levels and types of data required to provide insight for decisions on continuing,

expanding, contracting, or eliminating existing programs or establishing new programs. The data and criteria proposed can serve as a framework for institutional decisions on the need for occupational-technical educational programs. The precise application of the model rests on the judgment of the institution and its view of the precision of the data required and the resources available in gathering the data. In that regard, the plan has been designed to be a flexible document. The user must determine which part of the model is applicable to his or her circumstance and implement only those elements that are useful and practical in the current institutional context.

As just stated occupational-technical program needs assessment model is based on a two-part, multiple-level concept. Programs are divided into existing and potential new program categories, and each category has various levels of data gathering and evaluation. The data levels are based on the results of each succeeding evaluation in a hierarchical fashion. The principle which determines each level rests on gathering only sufficient data to determine if a change in an existing program is indicated or if a potential program is viable for an institutional viewpoint. Although basically designed to focus on individual occupational programs, the model can also be adopted to gather general data on other offerings of the institution, such as continuing education and skill upgrading courses, or determine a wide range of employer, student, or community needs. Such adaptation will be addressed

briefly in various sections of this paper.

Existing programs are initially evaluated on institutional generated data concerning student enrollment, placement or potential placement, student economic benefit and published state and BLS manpower statistics. Programs reflecting conditions which indicate a possible need for change in scope are identified as a result of this first level evaluation; and more detailed data are gathered on the job market, supply, and student interests. If change is still potentially indicated, a third level detailed review of local existing and projected conditions is undertaken and a program change decision is made.

A similar approach is taken in determining the need for new programs. The initial question to be answered is what types of programs are within the potential of the institution and have a possibility of meeting employer/student/community needs. Once potential programs are identified, general data on the manpower and economic components of the program are gathered and evaluated. If the program is still considered viable after this review, then a third level detailed review of data in these components is conducted; and a tentative program decision is reached on whether or not to implement the program.

The generalized concept presented is reflected in figure 1. Although the two-part, tri-level approach is presented as an overall concept, specific planning elements are structured in such a way that data on both new or existing programs and for multiple

levels of evaluation can be gathered simultaneously, if the institution so desires. This allows the maximum flexibility in tailoring the model to fit institutional needs.

A summary of the various categories of data which are recommended for use in performing a need assessment using the proposed model is reflected in figure 2. These categories of data are described in the following system.

FIGURE 1

MULTIPLE LEVEL NEEDS ASSESSMENT CONCEPT GENERAL

TYPE OF DATA INCLUDED

Evaluation Level	Existing Programs	New Programs
Level 1 Initial Evaluation	Data gathered on all existing programs on a continuing basis with annual evaluation: 1. Graduate placement and enrollment date. 2. Student enrollemnt and inquiry data. 3. Published State Employment Security Commission and BLS data (supply and demand). 4. State Vocational Education Plan Data. 5. Wage profile and student cost/benefit ratio.	A general review of potential programs not offered by the institution which are in scope of stated goals/objectives of school and for which a tentative capability exists. Identification based on review of: 1. Program inquiries. 2. Published State Employment Security Commission and BLS Data (supply and demand). 3. Secondary Student Interest Surveys. 4. State Vocational Education Plan Data.
Level II Individual Program Screening	Data gathered on specific programs for which Level I screening indicates a potential change: 1. Localized State Employment Security Commission Data. 2. Advisory Committee/Faculty Predictions. 3. Secondary Student Interest Data (existing). 4. Graduate Projection-other local institutions. 5. Institutional cost per-graduate.	Data gathered on potential new programs identified during Level I review: 1. Graduate projections other institutions. 2. Local/Regional State Employment Security Commission Data. 3. Estimated wage profile and student cost/benefit ratio.
Level III Individual Program	Data gathered on programs for which change in scope is strongly indicated by Level II evaluation: 1. Employer Survey 2. Student Survey 3. Adult Survey 4. Major modernization investment costs. 5. Estimated future wage/promotion opportunity. 6. Social benefit to student.	Data gathered on programs for which a significant employment market and student interest/benefit exist based on Level II review: 1. Employer Survey 2. Student Survey 3. Adult Survey 4. Estimated institutional start-up/operating costs.

FIGURE 2

PROPOSED CATEGORIES OF DATA FOR OCCUPATIONAL-TECHNICAL EDUCATION NEEDS ASSESSMENT

(Sub-elements of Each Category Shown in Priority Order)

MANPOWER COMPONENT (DEMAND)	MANPOWER COMPONENT (SUPPLY)
-Graduate Placement Data -Local State Employment Security Agency Data* -State Vocational Education Report Data* -Advisory Committee Prediction -BLS Occupational Outlook Handbook Data* -BLS Occupational Projections and Training Data* -Employer Survey Data*	-Local Graduates from Vo-Tec Programs (Public)* -Local State Employment Security Agency Data* -State Vocational Education Report Data* -Local Graduates From Vo-Tec Programs (Private)* -Local Graduates from Vo-Tec Programs (Proprietary)* -Local Graduates From Vo-Tec Programs (Industrial/Union)* -Advisory Committee Prediction -BLS Occupational Projections and Training Data*
STUDENT INTERESTS	ECONOMIC CONSIDERATIONS (INDIVIDUAL)
-State Secondary Student Interest Profile Data* -Enrollment Data -Data on Program Inquiries* -Local Survey Data-Secondary Students* -Local Survey Data-Adults*	-Wage Profile of Graduates -Local State Employment Service Salary Data* -Cost-Benefit Ratio Analysis* -Advisory Committee Estimates -BLS Occupational Outlook Handbook Data* -Estimated Future Wage/Promotion Prospects*
ECONOMIC CONSIDERATIONS (INSTITUTIONAL)	
-Estimated Start-Up Costs** -Cost Per Graduate -Modernization Investment Costs	

NOTE: *Category Of Information For Proposed and Existing Programs

**Category For Proposed Programs Only

DESCRIPTION OF CATEGORIES OF DATA FOR OCCUPATIONAL-TECHNICAL EDUCATION NEEDS ASSESSMENTS

MANPOWER COMPONENT (DEMAND)

(1) Graduate Placement Data: Local institutional follow-up data by program on graduates during previous year data should include: (1) Total graduates; (2) number available for placement (total graduates less individuals not desiring placement or unavailable for placement for non-institutional reasons, eg., marital status change, health, etc.); (3) number placed in directly related and closely related jobs; (4) number not placed; and (5) ratio of graduates available for placement to the number placed. Individual yearly totals for three years and aggregate three year totals should be presented. Data on average monthly requests for referrals made by employers to the institution's placement office shown by the last three years are also valuable if available.

(2) Local State Employment Security Agency Data: Each State has a system of capturing and displaying labor market data. The exact format for publishing such data varies and must be determined locally. Localized data on

vacancies must be judged against the degree of use by local employers in requesting placement through the local agency office. Ideally, data on total positions and number of job vacancies on a monthly basis should be available. The Occupational Outlook Handbook contains State contact points for obtaining information on the type data available.

(3) State Vocational Education Reports: Each State submits an annual program plan for the administration of vocational education to the U.S. Office of Education. As a minimum, this plan contains projections for one and five years for the demand for new employees in specific occupation areas. These data can be used to determine overall State trends and confirm local trends or signal the need for exploration of reasons, if local data differ significantly from State trends.

(4) BLS Occupational Outlook Handbook: The Handbook contains occupational briefs on 300 occupations grouped into 13 clusters of related jobs. Each occupation contains verbal descriptions for occupational growth and job opportunity. These descriptions are defined in the Handbook and can provide a rough measure for determining State and local data for their comparison to national

trends.

(5) BLS Occupational Projections and Training Data: BLS Bulletin 2020 contains detailed statistics on employment in 1976, projected requirements for 1985, and the average annual job openings 1976-1985. Data are on a national basis and can be used to evaluate local and State data.

(6) Employer Survey Data: Data based on a questionnaire survey of major employers (50 or more employees). Best results are obtained if the survey is restricted to specific occupations and data are held confidential and not used in placement efforts. Projections should be for one and three years. Mail surveys normally experience poor return rates, while structured interviews are normally overly expensive.

(7) Advisory Committee Prediction: After committee formation, the opinion of program advisory committee members on the job market can be obtained. Normally descriptive terminology similar to that used in the Occupational Outlook Handbook is as accurate as numerical projections. Program faculty/administration opinions can similarly be obtained. One caution in using these data is the bias

of a "proprietary attitude" that may develop.

MANPOWER COMPONENT (SUPPLY)

(1) Local Graduates From VO-TEC Programs (Public): Public supported institutions such as vocational-technical centers, comprehensive high schools and technical/community colleges normally project their number of graduates for one and two years into the future. Also, by use of an enrollment/completion rate matrix, graduates can sometimes be projected with reasonable accuracy up to four years in the future. Such data are potentially the best source of supply data, since it is often available from State educational agencies. However, rules on release of this data vary; and it is possible contact with each producer may be required to obtain the needed data.

(2) Local State Employment Security Agency Data: The number of unemployed individuals possessing specific job skills registered with the Employment Security Agency is normally available. Although quite variable, frequent sampling of this data can produce a projection of the "normally available" potential workers in a speci ic occupational area.

(3) State Vocational Educational Report Data: The planning report referenced under manpower demand data normally contains Statewide supply projections for one and five years. Since data on other than "public schools" is normally not available, the data is restricted in that it only considers projected graduates as a function of projected public institution enrollments.

(4) BLS Occupational Projections and Training Data: BLS Bulletin 2020 provides a summary available statistics on the number of people completing training in various occupational fields. Data are national based and provide a trend comparison.

(5) Local Graduates From Vo-TEC Programs (Private, Proprietary, and Industrial/Union): This data can sometimes be obtained from local organizations; however, cooperation is often difficult to obtain on the existence of programs, and especially in proprietary or industrial/union programs. The quality of these data is highly variable since enrollment projections do not exist and the program levels/existence is often uncertain. The data are most valuable when a new program is under consideration, since it identifies sources of supply.

(6) Advisory Committee Prediction: The use of verbal descriptors as to supply can be obtained; however, the data base available to the committee is highly subjective. Faculty input can also be obtained in descriptive terminology; however, proprietary interests in the program tend to reduce the validity of these data.

STUDENT INTERESTS

(1) State Secondary Student Interests Profile Data: If there is a statewide or district wide testing program, it is often possible to obtain localized profile data on the educational and career goals of high school students. An example of such a program would be the administration of the American College Testing's "Career Planning Profile" to all secondary students in their junior year. The analysis of data gathered by this instrument provides ability, interests, and experience profiles organized into occupational clusters, as well as educational objective data of the tested population.

(2) Enrollment Data: The extent students create a demand for a program can be measured simply by enrollemnt data. A ratio of applicants to available seats in a program can reflect a rough measure of interest. A more

sophisticated admissions data system can provide data on program inquiries, applications, profile of student aptitudes and experience, and source of applicants' knowledge of the program. For existing programs, it is not too inaccurate to assume that if students register for a program and are placed upon completion, that it is a viable program.

(3) Data on Program Inquiries: A record of the type of programs prospective students inquire about can reflect interest. These data can be compiled by an admissions record system and involve inquiries to all sources (counselors, instructors, administration, etc.). This source can be especially effective in identifying interest in new programs.

(4) Local Survey Data - Secondary Students: A Survey of secondary students generally produces a high return rate since cooperation from the surveyed institutions is required in advance. A well constructed survey can obtain information of perceived occupational goals, post-secondary educational goals, and broad interests of students. Use of the data must be approached cautiously, since the literature shows that respondents have little knowledge on which to base career choice

and often provide socially acceptable responses versus realistic choice. With the large number of mandatory testing programs, secondary school officials are also becoming reluctant to support "outside" surveys.

(5) Local Survey Data - Adults: A major need is occupational training for older citizens. Trends clearly establish that adult students are, in increasing numbers, a major element of post-secondary occupational programs. For those involved in training, the interest measures gained from enrollment/inquiry data are valid for this group. The use of surveys to gain additional knowledge of adult interests in the area of occupational education is often combined with a comprehensive community survey of needs. Such programs are relatively expensive and the validity of data low. The major use of this data would involve the generation of program ideas which would require further exploration. The more specific the target of the survey, (eg. members of specific occupational organizations surveyed for required upgrade training) the more likely the results will be usable in determining program offerings.

ECONOMIC CONSIDERATIONS (INDIVIDUAL)

(1) Wage Profile of Graduates: Use of locally obtained wages

of graduates entering jobs in the occupational area can be aggregated, and an average starting wage determined. These data can be used to judge the value added due to training over a base minimum wage of employees entering the work force without training. (Note: Normally the Federal minimum wage is an acceptable "floor" for entering nonskilled employees.)

(2) Local State Employment Service Salary Data: Normally average wages or starting wages for specific occupations are published by the various State Employment Security Commissions. These data are often regionalized within the State. Such data can help confirm the student reported wages and trigger further review to resolve reasons for significant discrepancies.

(3) Cost-Benefit Ratio Analyses: A comparison of student investment in training versus gain in terms of increased wages, provides an estimation of the economic value of the training. A suggested approach is to determine the total direct (tuition, books, transportation, etc.) and indirect (wages lost due to school attendance) cost to a student for completing a program. (Note: An assumption on indirect cost which is sufficiently accurate for comparison purposes is to multiply hourly Federal minimum

wage X 168 (Average Monthly Work Hours) X length of program in months. Although this does not include part-time earnings of a student, it can be reasoned that this supplemental income could also be earned if students worked full-time versus attending school full-time.) Once total cost is determined, it is converted to a yearly cost and compared to the expected post program income and an annual difference determined. This difference is divided into the total student cost to arrive at an estimated number of years required to amortize the investment. The higher the number of amortization years, the lower the ratio of benefit to cost.

(4) BLS Occupational Outlook Handbook Data: This source contains average wages (national) of described occupational areas. It can provide a reference point for the comparison of local wages. However, it has marginal utility in predicting local wage conditions.

(5) Advisory Committee Estimates: A judgment of starting wages can be developed from this source. The degree of accuracy is dependent on the number of members who have accurate data on wage scales. Normally, the estimate must be considered with caution. Estimates by

faculty must also be evaluated as to the degree they are based on empirical evidence.

(6) Estimated Future Wages/Promotion Prospects: Rapid promotions and accelerated higher earnings are characteristics of some jobs. However, data are difficult to obtain since employers often consider it "confidential" and longitudinal studies of graduates rare. Therefore, data is usually subjective and of marginal utility.

ECONOMIC CONSIDERATIONS (INSTITUTIONAL)

(1) Estimated Start-up Costs: For new programs, costs to gear-up for production are valid considerations, expecially if several programs are under consideration. Initial costs will reduce significantly once the program has been established and is operating. The start-up as well as continuing cost versus number of students served is one element which should be considered. The Institution must answer the question, "Can I afford it?", prior to determining to start a new program.

(2) Cost Per Graduate: The cost per graduate is an element of data which may be decisive in situations where program decision can go "either way." In these cases,

very high cost programs may require termination so other programs can be expanded or started. However, higher costs alone should not be used to terminate programs which reflect high need, strong interest, and favorable student cost/benefit ratios.

(3) Modernization Investment Costs: For existing programs, an overall needs assessment should be made prior to a commitment to expend significant resources for modernization. Marginally needed programs may not warrant the required investment.

SUGGESTED CRITERIA

Suggested Criteria for Evaluation of Categories of Data For Occupational-Technical Education Needs Assessment

The criteria suggested herein can serve as a guide in evaluating need assessment data. However, the reviewer must bear in mind that it is a complex matrix of data that makes up the need for an occupational-technical educational program, not one single element. This wholestic approach is essential in making judgments about program offerings. For example, the student cost-benefit ratio of a program may be unfavorable; however, student interest might be high as reflected by the number of applicants, and the projected job market conditions show a large need. Coupled with this data might be indications that the students in the program view the jobs they receive as "dignified" opposed to jobs paying equal wages for which no training is required; in other words, the training furnishes an intangible gain in social upward mobility. In this case, the positive factors can outweigh the fact that the training may be a poor economic buy for the students.

The suggested criteria are grouped in broad general categories which can be applied to various specific categories. In some instances a range of values is presented with corresponding

adjective descriptions. For both existing and new programs, several categories of data have been designated as critical and should be considered as having special significance in establishing the viability of the program.

Suggested Criteria:

1. Graduate Placement: A placement rate of 75% in directly or closely related jobs should be achieved. Lower rates indicate a need for more detailed review (critical data element).

2. Job Order Requests:

   Very Favorable - requests exceed projected graduates
   Favorable - requests equal graduates
   Marginal - requests range 99-75% of graduates
   Poor - requests below 75% of graduates

   Note: Programs with Very Favorable rates should be evaluated for expansion. Programs with Marginal or Poor rates should be considered for more detailed review dependent on other indicators.

3. BLS Occupational Outlook Handbook:

   Excellent - Demand much greater than supply
   Very Good - Demand greater than supply
   Good/Favorable - Balance between supply and demand
   May Face Competition - Likely more supply than demand
   Keen Competition - Supply greater than demand

   (as presented in Occupational Outlook Handbook - 1978-79 Edition, p. 5)

   Note: Proposed new programs with Excellent or Very Good potential may be considered for detailed local evaluation.

4. Supply/Demand Ratios: Ratios determined from national, state, and regional sources vary in their reliability and meaningfulness. Generally, national and statewide data should be treated similarly to the BLS data.

described above. Regional and local data should be given more weight in judging existing and new programs. The following criteria for these data are proposed.

Favorable - Demand exceeds supply by more than 2:1
Acceptable - Demand supply by up to 2:1 ratio
Marginal - Supply equal to demand
Poor - Supply exceeds demand

Note: The apparent disparity in recommending excessive demand in relation to supply is based on the fact that supply data is constantly underestimated due to the lack of data on source other than from formal public vocational programs.

5. Program Enrollment: Existing programs should be evaluated on enrollment and application data. This is considered to be a critical data element.

Suggested criteria are:

A. Applications to Program Vacancy Ratio

Excellent - 2 or more to 1
Acceptable - 1.5 - 2 to 1
Marginal - 1 - 1.5 to 1
Unsatisfactory - Less than 1 to 1

Note: Expansion of programs with Excellent ratios should be reviewed for possible extension. Ones with marginal or unsatisfactory rates should be subject to more detailed review.

B. Program Enrollment: Enrollment should be equal to the program enrollment potential. "Vacant seats" in a program indicate a need for more detailed review. A fill rate of less than 75% of capacity in one-year programs and the first year of two-year programs or a fill rate of less than 50% in the second year of two-year programs should be considered very poor. Generally, state vocational education criteria require a minimum of 15 students in the one year of the first year of programs, and a minimum of 10 students in second or beyond years in order to receive Federal funding. These criteria are

considered reasonable, and programs operating below these levels should be subject to more detailed review.

6. General Interest Surveys: Surveys can indicate general awareness/interest in an occupational area or training program. Normally such data is not definitive in nature, and an apparent lack of interest may really reflect a lack of knowledge. However, if the institution has publicized programs adequately, and surveys show little interest in occupational areas served by programs, a more detailed review is indicated. Although the type of survey questionnaires used, the aggregation of data into clusters, and the scope of the survey population in relation to the total population make specific interest criteria impossible, it is recommended the number of interested or projected interested individuals should significantly exceed the normally available openings in all local training programs.

7. Wage Profiles: Initial wages should be above those offered to untrained individuals (either in the same occupation or other occupations). Wage rates for program graduates - actual or potential - should exceed the Federal minimum wage by one or more dollars, or the program should be considered for further detailed review. For new programs, the higher the potential starting wage above the minimum wage, the more potential the program has for success in attracting students.

8. Cost-Benefit Ratio Analysis: A critical data element is the ratio of potential benefits to costs for the individual. The method recommended in the "Proposed Description of Categories of Data" is considered a good evaluation tool.

   The following are suggested criteria in terms of years to pay back costs based on the recommended analysis method:

		Years of Amortization	
		1 year program	2 year program
Excellent	less than:	3.5	5.5
Acceptable	from:	3.5 - 4.5	5.5 - 7
Marginal	from:	4.6 - 7	7.1 - 9
Poor	over:	7	9

Note: Marginal or poor cost benefit ratio should signal more detailed program review of existing programs.

Tailoring the Model to Institutional Requirements

In order to make the maximum use of the two-part, multi-level need assessment model a series of work sheets or planning forms have been developed. These forms enable the administrator to select elements of data that are most applicable to his or her institution and focus efforts on obtaining these data for evaluation and decision-making. These forms with instructions for their use are included in this section.

INSTRUCTIONS

FOR

NEEDS ASSESSMENT DATA SELECTION WORK SHEET

The worksheet is designed to allow the institution to select relevant data elements from the "Proposed Categories of Data for Occupational-Technical Education Needs Assessment." The form is so designed that each data element in each category is arrayed with a series of questions designed to focus on a decisions as to include or not include that element in the institutions personalized assessment plan. The questions to be answered yes or no are:

1. Desirable - is the element of data a desirable part of the institutions plan. Will it, in theory at least, reduce ambiguity about the scope or requirement of specific institutional programs in the context in which the institution operates.

2. Available - if desirable, is the element available from existing sources of data. For example, are current follow-up studies providing data on the employment status of program graduates.

3. Source to be developed: if desirable and not available, is the cost in terms of time, financial, and human resources justifiable in developing a source for the data element.

4. Include: the final status of each data element. Those items to be included from the institutions general outline plan for its needs assessment.

NEED ASSESSMENT DATA
SELECTION WORK SHEET

CATEGORY OF DATA	DESIRABLE		AVAILABLE		SOURCE TO BE DEVELOPED		INCLUDE	
	YES	NO	YES	NO	YES	NO	YES	NO
Manpower Component (Demand) Graduate Placement Data								
Local State Employment Security Agency								
State Vocational Education Report								
BLS Occupational Outlook Handbook								
BLS Occupational Projections and Training								
Employer Survey								
Advisory Committee Prediction								
Manpower Component (Supply) Local Graduates from VO-TEC Programs (Public)								
Local State Employment Security Agency								
State Vocational Education Report								
BLS Occupational Projections and Training								

NEED ASSESSMENT DATA
SELECTION WORK SHEET

CATEGORY OF DATA	DESIRABLE		AVAILABLE		SOURCE TO BE DEVELOPED		INCLUDE	
	YES	NO	YES	NO	YES	NO	YES	NO
Local Graduates from VO-TEC Programs (Private)								
Local Graduates From VO-TEC Programs (Proprietary)								
Local Graduates From VO-TEC Programs (Industrial/Union)								
Advisory Committee Prediction								
Student Interests State Secondary Student Interest Profile								
Enrollment Data								
Data on Program Inquiries								
Local Survey Data-Secondary Students								
Local Survey Data-Adults								
Economic Considerations (Individuals) Wage Profile of Graduates								
Local State Employment Service Salary Data								

NEED ASSESSMENT DATA
SELECTION WORK SHEET

CATEGORY OF DATA	DESIRABLE		AVAILABLE		SOURCE TO BE DEVELOPED		INCLUDE	
	YES	NO	YES	NO	YES	NO	YES	NO
Cost-Benefit Ratio Analysis								
BLS Occupational Outlook Handbook Data								
Advisory Committee Estimates								
Estimated Future Wage/Promotion Prospects								
Economic Considerations (Institutional Estimated Start-up Costs								
Cost Per Graduate								
Modernization Investment Costs								

INSTRUCTIONS
FOR
NEEDS ASSESSMENT DATA PROFILE

This form is designed to help fill out the outline plan. For each data element indicated for inclusions in the needs assessment plan the institution indicates the specific source of data and annotates the source with appropriate remarks. These remarks would deal with items such as who is responsible for the source, time frame of completion, particular part and level of evaluation (see The Concept Figure 1), etc.

Based on this profile the institution can begin to gather the data and placing it in a usable form. Suggestions for formating data and evaluation criteria are presented in subsequent portions of this document.

NEEDS ASSESSMENT DATA PROFILE

CATEGORY OF DATA	SOURCE	REMARKS
MANPOWER COMPONENT (DEMAND) Graduate Placement Data		
Local State Employment Security Agency		
State Vocational Education Report		
BLS Occupational Outlook Handbook		
BLS Occupational Projections and Training		
Employer Survey		
Advisory Committee Prediction		
MANPOWER COMPONENT (SUPPLY) Local Graduates from VO-TEC Programs (Public)		

NEEDS ASSESSMENT DATA PROFILE

CATEGORY OF DATA	SOURCE	REMARKS
Local State Employment Security Agency		
State Vocational Education Report		
BLS Occupational Projections and Trainjng		
Local Graduates From VO-TEC Programs (Private)		
Local Graduates from VO-TEC Programs (Proprietary)		
Local Graduates from VO-TEC Programs (Industrial/Union)		
Advisory Committee Prediction		
STUDENT INTERESTS State Secondary Student Interest Profile		

NEEDS ASSESSMENT DATA PROFILE

CATEGORY OF DATA	SOURCE	REMARKS
Enrollment Data		
Data on Program Inquiries		
Local Survey Data-Secondary Students		
Local Survey Data-Adults		
ECONOMIC CONSIDERATIONS (INDIVIDUAL) Wage Profile of Graduates		
Local State Employment Service Salary Data		
Cost-Benefit Ratio Analysis		
BLS Occupational Outlook Handbook Data		

NEEDS ASSESSMENT DATA PROFILE

CATEGORY OF DATA	SOURCE	REMARKS
Advisory Committee Estimates		
Estimated Future Wage/Promotion Prospects		
ECONOMIC CONSIDERATIONS (INSTITUTIONAL Estimated Start-up Costs		
Cost Per Graduate		
Modernization Investment Costs		

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APPENDIX

TO

Occupational-Technical Program

Needs Assessment Model

INFORMATION AND DECISION THEORY AND ITS RELATIONSHIP TO NEED ASSESSMENT

The Literature

In 1948, Claude Shannon, writing about his research in the Bell System's Laboratory, launched a communication theory commonly referred to as "Information Theory" (37). The original work was high mathematical and addressed communications in an electronic sense. However, exploration of the literature of Information Theory presented by Goldman (13), Feinstein (10), and Ash (3) and others establishes many concepts which are relevant to a non-electronic communication and the use of information. For example, Goldman and Feinstein both deal with the value of data which is to become information. They both focus on the predictive nature of data and the fact that information content of data increases with the degree to which it reduces ambiguity. Ash focuses in his writings on the fact that data, to become information, has to be used. The simple communication of data does not qualify the data as information; it must serve a specific purpose in the scheme of things set up by a decision-maker. Not all writers concerned with Information Theory were tied to electronics transmission. Quastler (45) deals with the application of Information Theory to psychology. In doing so he comments on the theoretical concept of channel "signal noise" that combines with desired data and

is neither desired or predictable, and thus, reduces the information content of the data since the receiver cannot tell which signals are accurate. Quastler suggests a solution to the problem of noise is redundancy. Multiple sources of data about the same event(s) increase accuracy by comparison of the degree of similarity of the received data. A similar effect can be obtained if the event is measured several times and each measurement transmitted separately to be compared and judged for accuracy by the receiver. By a systematic examination of these authors and others there appears to be a pattern which deals with the conversion of raw data (defined by the Dictionary of Education as: "Facts in isolation before exploration of their bearing on the subject inducing their choice.") to information. This pattern has a net effect of establishing a definition of information as: "selected data, transmitted to and received by a user which reduces ambiguity and is applied in reaching a decision." Using this definition, an exploration of literature can reveal other aspects of the process of conversion of data to information and its relation to the decision process. For example, Stufflebeam (61) proposes that the decision-maker, the final destination of the information, determines the channel capacity by judgements on what type and how much data will be transmitted. The decision-maker also determines the function of the decoder by specifying what information will be screened out prior to reaching a destination. Thus, we see the ultimate user of information determines the amount and type of data which is allowed to flow through the communication system.

Another area which has application in understanding information is the use of information systems. Prince (32) provides an extensive discussion of this area. He points out that many information systems are primarily based on what information is currently used in decisions and proposes that a more appropriate mode would determine what information is actually needed, thus reducing low quality information. Specifically his proposition states:

> The common situation in a given business organization prior to the establishment of the ideal set of information systems is that business management has too large a quantity of certain types of information and has voids in reference to other required information. (32:20)

He further supports concepts previously discussed when he states (32:24) "The decision maker must be capable of understanding and using the relevant data that are being transmitted to him before these data can properly be classified as information."

In summary, an initial review of information-related literature indicates information is data that is selected, usually from sources with a high probability of containing useable data, and transmitted to a user. Dependent on the noise (or error) in the transmittal channel, the selection of data sources often are redundant in nature. A quality of information is its ability to reduce future ambiguity, and since some degree of uncertainty exists as to "actual" versus "predicted" future conditions, data used to provide information have only a "degree of probability" of being accurate. The more confidence developed in the data, the greater the probability of high quality information, and the less data needed. Recipients of information must

be willing to identify sources of data and receive the data transmitted. Finally, to become information, data must be used.

The concept of information rests partially on the use of data to arrive at a decision. Decisions in their simplest form can be considered a choice between two or more alternatives. In a rational decision setting the process of choice is conscious. Failure to make a choice is, in effect, a decision (a decision to allow the status quo, or chain of events to conclude to their natural consequence); however, only acts of non-chosing that are purposeful and intended acts will be considered rational decisions. Other types of decisions based on "unrecognized consequence" will not be within the scope of this dissertation. Decisions under review here are the type envisioned by Drucker (8:351-64) when he stated: "Whatever a manager does he does through decision." Drucker describes the process of decision making as a five phase process. The phases are: (1) defining the problem, (2) analyzing the problem, (3) developing alternative solutions, (4) deciding upon the best solution, and (5) converting the decision into effective action.

A similar approach concerning the decision process is taken by Lundberg (25) who proposes a six step process which differs from Drucker's only in that a data collection step is added prior to selection of a preferred solution. Others such as Emory and Noland (9) and Heirs and Pehrson (19) propose sequenced decision patterns which are essentially the same.

Considering decisions as a process versus an event is an

important premise. It moves one from looking at the static act of choice to considering all activities related to the choice - both before and after - as part of the decision. In the description of the process are essential steps which convert data to information during decisions. The act of identifying and analyzing the problem as well as establishing criteria for its solution results in the selection of the type of data needed to arrive at the solution and defines the source. Gathering the data and bringing it to bear on the problem is essentially the act of transmission of the data to the user. As the data are used to judge possible solution, it reduces the ambiguity of the situation, and finally, as a preferred solution is reached, the data are used to make a choice. At this point, the data have met the conditions necessary to become information. Ruesch (36) supports the idea that information is most useful when it enables a prediction of outcomes prior to decisions. He feels ". . . the success of management depends on what information is chosen and how it is converted to action." (36:90) Although Ruesch stresses the role of information in prediction, he also recognized that information is never complete and states, "In all action, however, there remains an element of uncertainty due to unforeseen internal and external circumstances." (36:91) In short, under real world conditions, there is insufficient information to completely reduce ambiguity.

Some of the characteristics of information needed for decisions are pointed out by various authorities. Hussain (20) states information needs to be precise, accurate, and timely and its role is to reduce

uncertainty. He also points out that information results from specifically selected data and that the most critical deficiency under which most managers work is the lack of relevant information. Thompson (43) links information to cause and effect relationships and to the user's preferred outcome. The more certain the cause and effects relationships and the preferred outcome, the less the need for information. When the situation is complex and environment does not fully disclose alternatives or their outcomes, organizations need to develop a process for searching and using information as well as a system of making a choice. Demski (6) views information as a commodity to be used -- as any other resource -- in arriving at a decision. Since commodities have a cost, they can be compared to the benefit derived by their use. In the case of information, the benefit is the increased accuracy of the decision based on the information. If the cost is too high then the increase in accuracy of the information is not economically feasible. The consideration of cost of information is also presented by Cooper (5:49) who states:

> If we could collect all the pertinent facts bearing on a decision, within a reasonable time, we'd have very few problems of difficult decision making. As we have seen, however, the quality of 'all' is too elusive; we can afford neither the time nor the cost. We must therefore concentrate on obtaining the key pertinent facts.

Based on the preceeding brief discussion of decisions, it appears that rational decision-making is a conscious process involving the use of information. The decision-maker during the process identifies the data needed by defining the problem (or stating the situation to be evaluated) and establishing criteria for judging potential

solutions or alternatives. Data are gathered and applied in an analysis of alternatives which results in a selected solution. There is, however, never sufficient data to ensure absolutely the expected results developed from the available information. There is only some degree of probability that the future will be as predicted by the information. Cost is often a constraint in increasing the probability of accuracy, since data collection can be weighed in terms of a ratio of cost to benefit and "all" the information needed realistically cannot be justified economically. Information needs to be accurately presented, related to the context of the current situation and capable of describing the future. It must also be timely. Excessive data can clog processing systems and can hinder the reaching of valid decisions. As Drucker (7:16) states, in reaching decisions we should ask ourselves "What is the simplest method that will give us adequate results? And what are the simplest tools? Albert Einstein, after all, never used anything more complicated than a blackboard." Hence, overabundance and complexity in terms of information and information processing is not necessarily an asset.

Prior to linking information content and the decision process to occupational-technical education it is necessary to define the specific aera of interest. The need to provide skilled manpower for various industrial, technical, administrative, or semi-professional-type occupations has been met, in part, by training programs. These programs have been called vocational training, skill training, and occupational or technical education, to mention only a few titles.

Their common thread rests in their purpose -- to provide an individual with the skills required to do a group of tasks associated with a specific job area. This training can be offered in various settings: On-the-job, in industry-run schools, at private trade or business schools, at public secondary schools, or at community junior or technical colleges. In these settings the education process is almost exclusively below the 4 year degree level. For the purpose of this dissertation, the term "occupational-technical" or just "technical education" will be used to describe these programs, and consideration will be restricted to those programs offered primarily in community/junior/technical colleges.

A unique requirement exists for persons responsible for occupational-technical education. Unlike much of public education they must determine if there is a need for the training. Since the purpose of these programs is to provide individuals with employable skills (and society with competent workers), there should be related and viable jobs available when individuals finish the required training. Additionally, since this training is not mandatory, as is general public education, there must be individuals willing to undergo the training. These two factors -- jobs and students -- are the major elements impacting rational decisions as to whether to offer a given training program. Assuming that the institutions which are offering, or proposing to offer, a specific occupational-technical program want to have students, and want to have these students obtain jobs as a result of their education, information is needed on which to base the

decision of providing, or continuing to provide, the training.

The problems involved when the information used to reach decisions about technical programs is inadequate is reflected in a 1975 report by the National Advisory Council on Vocational Education (29:4) which states: "The report notices that too many students have been trained in fields where there are few or no jobs, and that the school systems are too slow in updating course content or adding new courses in fields where jobs exists." The report recommends that better information on need be obtained, and at a local level, schools continually update vocational educational programs and make them relevant to job market through better liaison with business and industry.

The major problem is a realistic definition of "better information" that will allow for updating courses or adding new courses. One approach is the use of surveys. The use of job market surveys is quite common and generally falls in two categories: (1) specific occupational areas and (2) broad based general surveys.

The use of surveys of a specific occupation are the least complex since they are narrowly focused. These types of surveys were used by Steely (39:40) who attempted to determine the need of legal assistants and human services technicians, and Armstrong (1) who also surveyed to establish the level of need for legal assistants. In both cases, mail surveys were used and the response was low, ranging from fifty-two percent in Steely's human service technician study to fourteen percent in Armstrong's study. Due to the very low return rate,

Armstrong elected to interpret the data as showing "no need" for the program. Steely, on the other hand, had returns of fifty-two percent and forty-five percent expressing the need for trained individuals so he recommended that training programs be started. In both cases the conductors of these studies felt the ambiguity of the future had been sufficiently reduced to allow a choice -- the data became information. Given the low level of response, however, the degree of quality of the information can be brought into question.

The problem with low survey return in occupational-technical educational needs assessments is not unique in the studies cited. Rall and O'Brien (34) report that in a study they conducted, most individuals contacted did not care to answer written questionnaires. The potential respondents felt that the time expended on filling out forms was wasted because the picture that emerged, for the most part, was distorted or at least slightly erroneous, and structured for a narrow range of conclusions. They generally found returns better from larger firms - firms with fifty or more employees. Similar results have been reported by Maloney and Eckstrom (26).

Another type of approach in trying to determine the educational need of a single occupation group is reflected in a HEW study on marine education (28). This study attempted to use existing information in the form of current literature and reports to establish such things as manpower needs, curriculum offerings, need for new programs, and occupational clusters. The result of this approach was not highly successful and only resulted in a recommendation for interagency

cooperation and a comprehensive marine occupational analysis. Apparently the targeted data area -- existing literature -- failed to contain information which would lead to a decision.

The broadly based general survey is also frequently used to determine the status of the job market. This technique is not new; for example, in 1925, a general occupational study was conducted in the city of Fresno, California (41). This survey of local business had as its objectives: (1) the nature and extent of the need for training in various occupations, (2) adjustment of training programs to community needs, (3) use of data for guidance, and (4) determination if industrial facilities could be used for cooperative vocational training. The report recognized the need to gather only significant and relevant data. It states: "The only information gathered was that deemed necessary in considering the need for vocational training and that needed for guidance purposes." (41:5)

Typical of the general surveys conducted today is the one reported by Maloney and Eckstrom (26) in Bridgeport, Connecticut. A checklist was used that was to be completed by employers. Employers were asked for the number of "job openings" in the one- and three-year future time frames for fifty-eight vocational specialties. The study showed employers in larger organizations make projections and will share them if they remain anonymous and if the data are not used for placement. They recommend an annual update to capture data for trending. All in all, they felt the data did project the local conditions for future job vacancies.

Perhaps the largest single system of projecting future manpower needs does not use survey techniques but is based on a complex projection technique. This technique developed by the U.S. Bureau of Labor Statistics (BLS) is described by Johnson (23) as providing a ten year forecast called "Tomorrow's Manpower Needs." The technique is based on projections of population/labor force growth, Gross National Product changes, and projected losses due to death and retirement. As a result, a trend is determined for 400 occupational clusters in 200 industries. These trends are reflected in state statistics as well as in the "Occupational Outlook Handbook." Although Johnson considers the projections fairly accurate, they are national and state-wide trends, and do not produce the more specific and localized data normally needed by institutions serving communities with technical educational programs. They can, however, serve as a basis of confirming local trends or of raising questions as to why local trends may run counter to national data. In this way they tend to help focus on the accuracy of local data.

An element of manpower data not yet brought into the information pattern for technical education is the question of supply. Data on the expected number of trained individuals becoming available is generally intergrated into state wide systems and into local or regional systems. By using a forecast supply component in conjunction with forecast gross demand (vacancy) levels, a net demand is determined. This net demand information provides decision makers with a basis to choose courses of action on creating, expanding, contracting, or

eliminating vocational-technical training programs.

The value of combined demand-versus-supply systems is reflected by Showalter (38) who feels these data are the most critical element in the determination of the need for vocational education. He feels, however, the supply issue is the weakest link, since little or no data are available on workers developing job qualifications through "on-the-job" training. He also points out that to be of value, supply data needs to be localized and constantly updated by follow-up studies. Johnson (23) also favors the supply/demand model in forecasting manpower needs. He states that vocational planners are consumers of program development data, and to be intelligent consumers they must understand the techniques of forecasting. The trends reflected in national and state data are suggested as a starting point. Such data, in Johnson's view, must be localized and should project one and five year needs.

State wide manpower-need forecasting systems are generally a 'supply/demand' model. For example, Illinois (21) has what can be considered a typical system. It is a computer based system which depicts statistics on a forecast manpower need in one and five years. The forecast model is based on job availability gained by industry wide surveys adjusted for economic growth, versus production from the state educational system. Production figures are based on current and projected enrollments in specific vocational and technical educational programs.

The use of a survey to obtain supply data is not widely

accepted. A very early type survey was conducted in 1916 in California (35). The purpose was to determine the type, extent, and relevance of vocational educational offerings. Today, with the structure of current educational reporting, production statistics are usually available. These statistics are generally the ones used in products such as the state systems previously cited.

Prior to discussing other approaches in obtaining data required to inform about the need for occupational-technical education, it is beneficial to look at the recommendations of a program developed to train individuals in gathering community based data (31). According to this source, data are gathered to: (1) show the current employment picture in certain occupations, (2) future employment requirements in these occupations, (3) the number of people involved in existing vocational training programs in the occupations being surveyed, and (4) trends in such areas as turnover, new occupations, and the effect of technological change. Such data can, in the opinion of the program developers, be converted to information by influencing decisions on the needs to revise existing curriculum, to eliminate certain courses, or to add new courses. The program suggests that localized surveys of employers and statistics on local educational program are the prime sources of data. One vital point is the need for institutions to define the local service area so that data collection can be realistic -- that is, define the target area.

The use of student interest data are fairly prevalent in methodology for determining technical education needs. Usually, student

interests are part of a profile of data designed to be converted into information by deciding on occupational-technical education program requirements. Fairly typical is the process proposed by Phillips and Tucker (30). In their orientation they define needs as the difference between what is and what should be. These authors advocate using all possible sources of data. They feel there are four elements to a needs determination process: (1) cost and benefit as it relates to the student, (2) manpower need forecasts, (3) social demand - the attractiveness of the program, and (4) social objectives - creating demand by society's need. The approach of combining job market data with student interest was also used by Harms (18). The effort combined elements of forecast job market data taken from state and BLS statistics for the Philadelphia, Pennsylvania area, with student survey data concerning student's job/training aspirations and perceptions of the labor market. Initially, students in grades eight/nine were surveyed with plans to add students in higher grades and adults in later studies. The results were projections for vocational educational needs through 1985. The author of the report says much of the governmental demand data was inadequate since it was set in time and did not reflect dynamic changes.

A multiple component approach similar to the one recommended by Phillips and Tucker was proposed by Lane Community College (15). The process contains six components: (1) manpower demands, (2) manpower supply, (3) school districts considerations, (4) student needs, (5) community considerations, and (6) cost/value to institution.

Hamlin (16,17), working with others, has done extensive work in the area of long range planning for vocational education. His work indicates survey techniques are only marginally useful due to the poor return rate and the vague perception of employment needs held by employers. He feels that a comprehensive vocational education committee should be formed to reduce training duplication and to pool data. Hamlin generally supports the use of employment demand/supply data and student interest data. One additional recommendation is to use placement data as a main evaluation of program success -- if students are placed, then the program is needed. He found other data contributes only marginally to information about the need for the program.

A major report on a highly complex system has been made by Fishkind (11). This system devised a five part method of determining needs: (1) overall economic analysis to determine the potential of economic/population growth, (2) projected labor demand, (3) projected supply of labor, (4) a comparison of these two projections of demands and supply to identify surplus and shortages, and (5) survey of existing vocational education programs. Fishkind stresses the local diversity of needs versus national trends reflected in national and state data. He believes needs should be not only projections of jobs and supply of labor, but also the cost of training, potential earnings, and contributions to the community. Fishkind identifies four major problems in most needs survey data: (1) data often inaccurate, (2) most data has a national -- not local -- character, (3) no supply data given (especially in BLS data which is so widely used), and (4)

projections based on economic growth with no attention paid to replacement or internal attrition.

A concern for incorporating potential earning versus cost to the student into the needs assessment data is voiced by Lecht (24). In his review of occupational characteristics, he points out that most job openings by 1985 will be low paying and therefore extensive training cannot be economically justified nor is there a need for high skill training. He also points out that estimating job openings are difficult due to a lack of accurate data on the need for job replacements which Lecht estimates to make up two-thirds of all vacancies.

Not withstanding the opinions presented on the inadequacy of information used (or not used) in reaching decisions on technical education, a system to produce data for conversion to information is essential. As stated by Howard Cosmey, Commissioner of Education for Minnesota (2:V), "Education decision making can no longer depend solely on past experiences or mystic - it demands viable information in the right hands at the right time. Decision makers in education must avail themselves of more sophisticated information processing systems if they are to operate effectively." As Andrew and Moore (2:2) state: "An essential component of decision-making . . . is information. Information is data which is used as an aid to decision making."

The information needed for occupational-technical education reflected in this brief review of literature is related to forecasting the impact of two major variables. One is the manpower status of the

occupational areas being considered in the educational setting. This variable consists primarily of demand data (specifically the number of jobs expected to be available for new employees) and the supply of employees that is being generated. The second variable is the potential students - his or her willingness to undergo training and the potential benefit of that training. These data must be reflected in terms of local conditions if they are to have a major information content for local educational programs.

SUMMARY OF RELATIONSHIPS

The concept of information is approached differently by various authors. To some, the term information is synonymous with data and covers any symbolic representation of events or ideas. However, there is a large body of literature which sets specific criteria for information. The general approach is to prescribe conditions under which data - a general body of symbolic knowledge or facts - is converted to information. The conditions most often established are that the data selected for processing to information are selected specifically because of their relationship to a defined situation. The selection is based on the probability that the data can provide knowledge about future conditions. The reduction of future ambiguity by the prediction of the results of certain courses of action is a major focus of data which are to become information. Based on the knowledge of the future provided by the selected data,

a choice from possible alternative action is made, in other words, the data are used. The above conditions for conversion of data to information (purposeful selection, reduction of future ambiguity, and use in making a choice) are those applied in this proposal to review decision-making and its relationship to information.

Decision, as discussed in this proposal, is more than an event; it is the choice of an alternative action; it is a rational process. The process is based on the presumption that an entity (organization, institution, individual, etc.) wishes to achieve a specific purpose, and as such is not acting in a random fashion. Based on this presumption, a general model of decision making emerges from the literature. First, the specific issue under consideration is defined (a question generated or problems stated). Next, the issue is analyzed and alternative actions developed, about which future consequences must be predicted. Data are then applied which clarify, in some degree, the future conditions which would exist if a specific alternative is selected, and the conditions are evaluated against established criteria. Based on the evaluation, a course of action is selected and implemented. This process is, in fact, a process to convert data into information. Available data are used to define the issue and select alternatives and evaluation criteria, which in turn acts to select the type of data that must be obtained in order to predict the future consequences of a given choice. Once the data are obtained, applied and the ambiguity of the future is, in some measure, reduced this allows a choice to be made from among

the alternatives. The data used in the process become "information", and is a central factor in the quality of the decision process. If selected data only marginally reduced ambiguity the future will be relatively uncertain, and thus, the choice will not be optimum. Optimum in this case would be a high degree of probability that the actual consequences of the choice will be very similar to the predicted consequences.

In occupational-technical education, the decision of whether to offer a program is a critical process. This process -- often referred to as a needs assessment -- is analogous to the process just described. Although educational decision-makers often do not define and organize their actions neatly into decision process steps (nor do many other decision-makers), an analysis of the literature show an underlying sequence of events. An objective is chosen. This objective ranges from defining all future national occupational needs, as is the case of the BLS reports, to providing information for decisions on one specific occupation in a local community. In general, options are developed. In the case of existing programs, these options deal with the continuation, expansion, contraction of, or elimination of the program, while for new programs the options generally are restricted to implementing or not implementing a program. The criteria normally used to judge the options rest primarily on the degree that jobs for trained individuals will exist in the future. Also, students needs, as well as economic considerations, institutional and individual, are often part of the value criteria against which

program judgements are reached. The selection of the scope of the issue, the alternatives possible, and the judgmental criteria all define the target area and often the method used to provide relevant data on which a decision as to the need for occupational-technical educational programs is based. The range of data which are converted to information generally consists of: (1) data on the existing and future job market, most normally expressed in terms of potential job vacancies, (2) the supply of new workers to fill near-term and long-term job vacancies, (3) the desire of potential workers to undergo formal training in specific job areas, (4) the long-term occupational aspirations of potential students, (5) employers' willingness to hire workers trained under the technical education program, (6) economic benefit to the worker in relation to the cost of his or her training, (7) and the institutional cost of training. The extent to which data in these categories are used depends on the criteria selected to judge alternatives. Data which do not relate to specific criteria are usually not gathered, since the data could not be used, and therefore would have no information value.

To determine the need for specific occupational-technical programs high quality information is needed about future conditions of the manpower situation and student attitudes. The literature indicates several conditions which tend to improve the quality of information in these areas. Most importantly, data should be localized in terms of job availability and student interests. National, state, and regional data are useful in evaluating the accuracy of localized

data. Data should be gathered periodically so that trends can be observed. For existing programs, graduate placement statistics are one of the best sources of data about program viability. Multiple sources of data are highly desirable. In the area of supply of newly qualified potential workers, statistics published by local educational agencies on projected program graduates are a prime source of data. Projections of manpower conditions should be restricted to one and three or five year time frames, as longer range projections are highly inaccurate. In most instances, the narrower the scope of the program data being obtained, (e.g. on one specific occupational program versus all institutional programs) the higher the probability that accurate data can be obtained from area employers. Student interest data is normally available as a result of surveys of secondary school students. Since cooperation of local school districts is generally good, a high return rate can be anticipated. Community wide surveys of adult interests can provide useful data, particularly on job change or upgrading needs.

In summary, information is data which provide knowledge about the probable course of future events in relation to a specific issue. This knowledge allows a choice to be made between alternative actions. In the process of decision-making, rational choice is based on the information obtained and made available to the decision-maker. In the area of the requirements for occupational-technical education, this information deals primarily with the availability of jobs and the willingness of a student to undergo training.

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EXAMPLE

PROGRAM/DOT JOB TITLE INVENTORY

PROGRAM - DOT JOB INVENTORY

To establish a common base for relating jobs to program offerings, it is recommended that it be determined which Dictionary of Occupational Title (DOT) jobs are directly or closely related to the program graduates qualifications. This DOT base has several advantages: (1) it establishes a common language frequently used by major industrial employers, (2) allows inquiries into most State Employment Security Commission computerized data bank, (3) provides a standard classification inventory for follow-up and placement activities, and (4) creates a cross-reference instrument for use in the career center.

The best source of data on which DOT jobs relate to programs is the actual department head/program instruction. They have the specific knowledge of what skills a program is structured to teach students, and for which jobs in the world of work graduates are directly or closely qualified. Therefore, the best approach is for these individuals to make the determination of program - job relationships and designate which jobs listed in the DOT should be included in the "Program - DOT Job Inventory."

The following instructions are provided for completing the inventory:

(1) Each program offering (degree or diploma) should be listed with the corresponding DOT Jobs which are directly or closely associated to the training received by graduates.

(2) Directly related jobs should be jobs for which the majority of training is relevant and which, in the opinion of the department head/instructor, normally would be appropriate employment for graduates of the program.

(3) Closely related jobs should be jobs for which some of the training is related or has some "transfer value," but which would normally not be considered a prime occupation of a program graduate.

(4) The 1977 (Fourth Edition) of the Dictionary of Occupational Titles should be used as a source.

PROGRAM - DOT JOB INTERVIEW

PROGRAM	DOT CODE	DOT TITLE	JOB* STATUS
Dental Assistant	079371010	Dental Assistant	D
Med. Lab Technician	078362026	Med. Lab Technician	D
Ward Secretary	245362014	Ward Clerk	D
Child Care Assistant	359677018	Nursery School Attendant	D
	359677010	Attend-Childrens Institution	D
	359677026	Playroom Attendant	D

*Note: Use "D" for directly related jobs and "C" for closely related jobs.

EXAMPLE OF

EMPLOYERS PROGRAM NEED SURVEY QUESTIONNAIRE

(SPECIFIC PROGRAM)

INSTRUCTIONS

FOR

SPARTANBURG TECHNICAL COLLEGE

DIESEL MECHANIC SURVEY QUESTIONNAIRE

This questionnaire is strictly confidential. Its purpose is to help determine the need of a new/existing diesel mechanics training program at Spartanburg Technical College. Please mark your answers by checking the letter which fits the best response to each question. Please return the completed questionnaire in the self-addressed-preposted envelope. Your cooperation is greatly appreciated.

NOTE

This questionnaire can be mailed or used as a structured interview form. Scoring is easily accomplished by hand on a master tally sheet.

SPARTANBURG TECHNICAL COLLEGE

DIESEL MECHANIC SURVEY QUESTIONNAIRE

Definition: Repairs and maintains diesel engines used to power machines, such as buses, trucks, electrical gnerators, construction machinery, and automobiles, using handtools, precision-measuring instruments and machine tools. Diagnoses troubles, disassembles engines, and examines parts for defects and excessive wear. Reconditions and replaces parts, such as pistons, bearing, gears, valves, and bushings, using engine lathes, boring machines, hand-tools, and precision-measuring instruments. (DOT CODE 625.28-010)

1. Does your firm currently employ persons as "diesel mechanics" as defined above?

   a._____Yes (Go to question 2)

   b._____No (Go to question 14)

2. How many diesel mechanics are currently employed?

   a._____ 1-5 d._____15-25

   b._____ 6-10 e._____over 25 (please indicate #_____)

   c._____ 10-15

3. How many diesel mechanics have been hired in the last 12 months?

   a._____ none d._____ 5-9

   b._____ 1-2 e._____ over 9 (please indicate #_____)

   c._____ 3-5

4. How would you classify the skill qualifications of newly hired diesel mechanics?

   a._____ none hired d._____ good

   b._____ poor e._____ excellent

   c._____ adequate

5. What was the source of training of newly hired diesel mechanics.

a._____ self trained
b._____ on the job training
c._____ company school
d._____ Community/Technical Colleg
e._____ Vocational High School
f._____ private school

6. How would you characterize the supply of diesel mechanics available for employment?

a._____ very scarce
b._____ some shortage
c._____ adequate supply
d._____ more available than needed
e._____ serious over-supply

7. How many diesel mechanics do you estimte you will hire in the next 12 months?

a._____ none
b._____ 1-2
c._____ 3-5
d._____ 5-9
e._____ over 9 (please indicate #_____)

8. Do you plan to increase the number of diesel mechanics employed in the next three years?

a._____ No
b._____ Yes 1-2
c._____ Yes 3-5 more
d._____ Yes 6-9 more
e._____ Yes 10 or more (please indicate #_____)

9. Based on future expansion, retirement, turn-over, etc. how many diesel mechanics do you estimate you would hire three years from now? (36-48 months from present)

a._____ none
b._____ 1-2
c._____ 3-5
d._____ 5-9
e._____ over 9 (please indicate #_____)

10. Would you favor a diesel mechanics program be established at Spartanburg Technical College?

a._____Yes (Please answer Question 11)

b._____No (Please answer Question 13)

11. Would you hire Spartanburg Technical College graduates as diesel mechanics?

a._____ yes - as mechanics

b._____ yes - as apprentice only

c._____ yes - only if other experienced mechanics are not available

d._____ undecided - depends on other applicants

e._____ no - other sources sufficient

12. The average hourly wage for newly hired diesel mechanics (assume formally trained but mimimum experience)is:

a._____ less than $3.75 (please indicate _____)

b._____ $3.75 - $4.00

c._____ $4.05 - $4.25

d._____ $4.30 - $4.50

e._____ over $4.50 (please indicate _____)

(Go to question 16)

13. If you answered "NO" to question 10 would you characterize your reason for not favoring a formal program at Spartanburg Technical College:

a._____ Don't believe school trained mechanics are qualified

b._____ School graduates have no experience

c._____ Previous Spartanburg TEC graduates were poor employees

d_____ Enough mechanics available without new school programs

e._____ other (please indicate)_____

_____

_____

(Go to question 16)

14. Do you plan to employ diesel mechanics?

a._____ Yes - next 12 months

b._____ Yes - next 3 years

c._____ No

15. If yes, indicate number. If No, go to question 16.

a._____ 1-2

b._____ 3-5

c._____ 5-9

d._____ 10-15

e._____ over 15 (please indicate #_____)

16. Your type of business

a._____Trucking firm

b._____auto repair

c._____truck repair

d._____ construction equipment repair

e._____ other (please indicate)

_____

_____

17. Name of firm:_____

18. Title of person completing questionnaire_____

Notes:

1. Questions can be modified to support existing program versus new program for example: question 10/11 can be phrased:

   10. Are you aware of the diesel mechanic program at Spartanburg TEC?

   11. Have you hired Spartanburg TEC graduates as diesel mechanics?

2. Additional questions on experience with existing program graduate can be added as well as the number of graduates employed.

3. Questions can be included which ask employer to identify other positions for which he has experienced insufficient supply/poor qualifications. These questions can be augmented with questions on number of such positions,need for formal training, level of training, etc., thus obtaining some indications of other needs.

4. Data on the need for short technical skill upgrade courses, personal life skill development, special seminars, etc., can be requested in the questionnaire. Also information on the employers willingness to support such courses on a release time or "in plant" basis might also be sought. This would make the original survey more comprehensive, however, the addition of questions of this nature may reduce the return rate due to length and a perception of irrelevance of the questions. A structured interview would be best if the survey is expanded to a full comprehensive employer needs/attitude questionnaire.

EXAMPLE

OF

COMMUNITY SURVEY QUESTIONNAIRE
(Telephone/Interview)

COMMUNITY SURVEY QUESTIONNAIRE
(Telephone/Interview)

Hello, my name is _____. We are taking an educational interest survey for Spartanburg Technical College. I would like to ask you a few questions about how we may be able to help the community.

1. First of all, are you or an adult member of the household presently enrolled in any education or skill program?

   a._____yes

   b._____no (go to question 8)

   c._____Don't know (go to question 8)

2. Who is enrolled?

   a._____wife
   b._____husband
   c._____daughter
   d._____son
   e._____Mother
   f._____Father
   g._____other (specify)

(Get data for each student for questions 3 - 7)

3. Are they full-time students?

   a._____ yes

   b._____no

   c._____Don't know

4. Does this program lead to a degree?

   a._____yes

   b._____no (go to question 6)

   c._____don't know (go to question 6)

5. And what degree is that?

   a._____ applied

   b._____ bachelors

c._____Masters

d._____Doctorate

6. And what is the major field of study?

a._____Adult Education (GED)

b._____Industrial

c._____ Technical

d._____Allied Health

e._____Business

f._____Arts and Science

g._____Education

h._____Personal Development/Interest

i._____Other (specify)

7. At what school are you/they enrolled:

a._____USCS

b._____Converse

c._____Wofford

d._____Spartanburg Methodist College

e._____Spartanburg TEC

f._____Rutledge

g._____Other (Specify)

8. Is there something you or a member of your household would like to learn more about - say a job skill, hobby/craft, or academic subject?

a._____yes (indicate who is interested)

b._____ no (go to question 17)

c._____don't know (go to question 17)

9. What is the subject you/they would most like to learn about?

a._____ c._____

b._____ d._____

10. What is the prime reason you/they want to study this subject?

a._____job upgrade

b._____learn new skill for better job

c._____personal interest

d._____academic credit

e._____other (specify)

11. How much class time can you/they devote to this?

a._____less than 2 hours

b._____ 2-4 hours

c._____ 4-10 hours

d._____11-20 hours

e._____over 20 hours

f._____ can't say

12. What time of day would be most convenient?

a._____morning

b._____afternoon

c._____evening

d._____ no preference

e._____can't say

13. What day would be most convenient?

a._____Monday

b._____Tuesday

c._____ Wednesday

d._____Thursday

f._____Friday

e._____Saturday

f._____Sunday

j._____No difference

k._____ can't say

14. How many days a week would you/they be available?

a._____one

b._____ two

c._____three

d._____four

e._____five

15. Is the location of course important?

a._____yes

b._____no (go to question 17)

c._____ can't say (do to question 17)

16. What would be the best location?

a._____local school (name_____)

b._____place in Spartanburg (name_____)

c._____Spartanburg TEC

d._____ Other (specify_____)

17. What is the biggest obstacles to your taking part in an educational program? (check first three reasons you are given)

a._____don't feel needed

b._____no time

c._____don't know about courses

d._____too old

e._____cost too high

f._____health problems

g._____transportation

h._____courses not conveniently located

i._____family responsibilities

j._____not capable

k._____other (indicate_____)

l._____none

18. Do you feel you/your family know enough about Spartanburg TEC?

a._____yes (go to question 21)

b._____no

c._____don't know

19. Is there information about the school you/your family would like to have?

a._____yes

b._____no (go to question 21)

c._____don't know

20. What kind of information is needed?

a._____general

b._____admissions

c._____costs

d._____programs

e._____other (specify)

21. Would you like to discuss education or career opportunities with a staff member?

a._____yes

b._____no

c._____don't know

22. If yes, how may be contact you?

Name_____

Address_____

Phone_____

Now just a few items to help describe who we surveyed:

23. Are you male/female?

a._____male

b._____female

23. What is your age group.

a._____ below 20

b._____20

c._____30

d._____40

e._____50

f._____60 or above

g._____won't say

24. Married or single

a._____married

b._____single

25. Are there others who live in the household?

a._____parents

b._____spouse

c._____children (no.)

d._____room-mate

e._____other

26. In what school district do you live?_____

NOTES:

1. Survey can be adapted to "mail questionnaire" form by slight modification of questions.

2. Questions on need for specific new programs or about special community programs can be added, however, length should be held to minimum.

3. Care must be taken to insure a respresentative sample is taken from all areas of the community. School district data can be helpful in determining pattern of respondents. Randon selection of telephone numbers from phone books is often a convenient way to make contact.

4. Interviewers should "practice" until approach is friendly and smooth. Spot checking of procedures is advised to insure the highest degree of accuracy possible.

EXAMPLE OF

STUDENT INTEREST SURVEY QUESTIONNAIRE

(GENERAL INTEREST)

STUDENT INTEREST SURVEY QUESTIONNAIRE

INSTRUCTIONS: Spartanburg Technical College is trying to find out about your future plans so it can better serve you and your fellow students' needs. Please help us by filling out this questionnaire, by checking the answer that best fits you for the following questions.

1. Your current high school preparation can be best described as:

_____A. Pre-College
_____B. Business/Clerical
_____C. Construction Trades (Carpentry, Masonry, etc.)
_____D. Mechanical Trades (Auto Mechanics, Welding, etc.)
_____E. Agricultural
_____F. General Curriculum

2. Do your plans after high school include more education (other than military)?

_____A. Yes (go th Question 3)
_____B. No (go to Question 6)
_____C. Undecided (go to Question)

3. What type of school do you plan to attend after high school?

_____A. 4-Year College
_____B. Junior/Community College
_____C. Technical College
_____D. Private Business College
_____E. Private Trade College

4. What would you say is the object of future education.

_____A. Learn more about the world
_____B. Learn a general skill
_____C. Learn a specific trade/skill
_____D. Prepare for further college

5. In your future education, how long do you expect to go to school prior to entering your chosen career?

_____A. less than one year
_____B. one year
_____C. two years
_____D. four years
_____E. more than four years

6. Which of the following best describes your current future career work.

_____A. Mechanical Trade (Welder, Mechanic, etc.)
_____B. Construction Trade (Carpenter, Masonry,etc.)
_____C. Agriculture/Farming
_____D. Salesperson
_____E. Office work (Secretary, Bookkeeper, etc.)
_____F. Factory worker (Machine Operator, etc.)
_____G. Professional (Teacher, Doctor, etc.)
_____H. Other (Please indicate _____)

7. If you are not planning to attend further education after high school, do you plan to:

_____A. Not applicable - going to school.
_____B. Get a job (indicate type _____)
_____C. Enter Military
_____D. Get married
_____E. Other (Please indicate _____)

8. How well informed do you feel you are about your future career choice?

_____A. Know all about it
_____B. Fairly well informed
_____C. Have some limited knowledge
_____D. Know little about it
_____E. Have almost no knowledge

9. Where did you gain your knowledge about your future career choice?

_____A. High school counselor/programs
_____B. Family
_____C. Friends
_____D. Worked part-time in job
_____E. Other (Please indicate _____)

10. What specific job do you intend doing after you finish your education?

_____.

11. Have you ever considered attending a technical-vocational training program (Such as business, secretary, auto mechanics, X-ray technician, etc.) after high school?

_____A. Yes
_____B. No
_____C. Never knew such programs existed.

12. Would you be interested in learning more about technical-vocational education?

_____A. Yes
_____B. No
_____C. Undecided

13. If you want more information on technical-vocational education, please provide the following:

Name_____

Address_____

City_____ State_____ Zip_____

Notes:

1) If a specific new program is being considered, a series of questions can be added about interest in that program.

2) A section on specific programs offered by the Institution conducting the survey can be added to measure interest in those programs.

3) Answers to question 12 & 13 can be used to follow-up potential students.

4) A simple tally sheet can be used to aggregate the responses, or if individually numbered questionnaires are used, a more complex machine scoring can be devised to cross relate answers. For example, answers to question one-type high school program can be related to question six-future career choice. This interrelated approach can help determine internal consistancy of each respondent questionnaire.

EXAMPLE OF JOB-ORDER ACCOUNTING FORMS

JOB ORDER ACCOUNTING

Attached are two examples of forms to track placement job orders. General guidance on their use follows:

(1) The DOT listing of "Program/DOT Job Titles Inventory" serves as a guide for determining what jobs fit what program and if they were "close or directly" related.

(2) Each month a simple tally mark is entered for each job order/placement. (eg. ~~𝍸~~ = 5). At the end of each month the total from the tally sheet would be entered on the summary sheet. A year to date total would be entered in the total column of this form.

(3) Summary sheets would be evaluated with other "needs assessment" data as part of the picture on the programs viability.

(4) One area requiring special attention is job requests received directly by instructors/departments. A system of having them documented and processed for accounting through the placement office may be required

SUMMARY OF PLACEMENT REQUESTS BY MONTH YEAR_____

DIVISION/PROGRAM	JAN.		FEB.		MAR.		JUNE		JULY				TOTAL	
	DIR.	CLOS.	DIR.	CLOS.	DIR.	CLOS	DIR	CLOS	DIR	CLOS			DIR	CLOS
ALLIED HEALTH														
DENTAL ASSISSTANT														
MEDICAL LAB TECHNICIAN														
RADIOLOGIC TECHNOLOGY														
SURGERY TEC (OPERATING ROOM TECHNICIAN)														

SUMMARY OF PLACEMENT REQUESTS BY MONTH YEAR_____

DIVISION/PROGRAM	AUG.		SEPT.		OCT.		NOV.		DEC.				TOTAL	
	DIR	CLOS	DIR	CLOS	DIR	CLOS	DIR	CLOS	DIR	CLOS			DIR	CLOS
ALLIED HEALTH														
DENTAL ASSISTANT														
MEDICAL LAB TECHNICIAN														
RADIOLOGIC TECHNOLOGY														
SURGERY TEC. (OPERATING ROOM TECHNICIAN)														

PLACEMENT REQUEST TALLY SHEET

MONTH

DIVISION/PROGRAM	JOB ORDERS		PLACEMENT	
	DIRECTLY RELATED	CLOSELY RELATED	DIRECTLY RELATED	CLOSELY RELATED
ALLIED HEALTH				
DENTAL ASSISTANT				
MEDICAL LAB TECHNICIAN				
RADIOLOGIC TECHNICIAN				
SURGERY TECHNICIAN (ORT)				
CHILD CARE ASSISTANT				

SAMPLE FORMAT

LOCAL SUPPLY AND DEMAND EXPERIENCE

GRADUATE FOLLOW DATA

SPARTANBURG TECHNICAL COLLEGE CURRENT PROGRAMS

LOCAL SUPPLY AND DEMAND EXPERIENCE - 1976, 1977, 1978
(source - Graduate Placement Records - Spartanburg Tec) 2/

PROGRAM 3/	1976					1977					1978				
	Grad	Placed			Not Pled	Grad	Placed			Not Pled 3/	Grad	Placed			Not Plc
		Dir	Clos	Tot.			Dir	Clos	Totl			Dir	Clos	Tot	
ALLIED HEALTH															
DENTAL ASSISTANT	13	13	-	13	0	9	9	0	9	0					
MEDICAL LAB TECHNICIAN	10	10	-	10	0	13	13	0	13	0					
RADIOLOGIC TECHNOLOGY	11	10	1	11	0	10	10	0	10	0					
SURGICAL TECHNICIAN	12	12	0	12	0	7	6	1	7	0					
WARD SECRETARY	17	14	0	14	0	22	19	0	19	1					
CHILD CARE ASSISTANT	8	6	0	6	1	18	7	2	9	3					
ARTS AND SCIENCE	-	-	-	-	-										
HORTICULTURE	10	7	0	7	1	10	7	2	9	0					

NOTES:

1. Based on annual calendar year survey of each graduate of Spartanburg Tec reflects ability of student to find employment in area of education program completed.

2. Not placed includes only students who desired job in their educational specialty and could not obtain a position. Excluded are individuals who are not employed in their specialty due to pregnancy, marital status change, continued education, unwilling to relocated to job, etc.

3. Includes only current program.

SAMPLE FORMAT

STUDENT COST BENEFIT ANALYSIS

SPARTANBURG TECHNICAL COLLEGE
STUDENT COST BENEFIT ANALYSIS

PROGRAM (by division)	WAGES (HOURLY)				ESTIMATED COST TO STUDENT			ANNUAL DIFFERENCE OVER MINIMUM WAGE	
	Spartanburg TEC Grad (1			Local (2	Direct (3	Indirect (4	Total		
	1976	1977	1978					$	Years
Allied Health	-	-	-	-	-	-	-	-	-
Dental Assistant	$3.02	$2.68		-	$520	$5,512	$6,032	$728	8.3
Medical Lab Technician	$4.66	$4.16		-	$910	$9,646	$10,556	$3,848	2.8
Radiologic Technician	$4.03	$4.64		-	$1,040	$11,024	$12,064	$4,140	2.9
Surgical Techn	$2.95	$2.72		-	$520	$5,512	$6,032	$624	9.7
Ward Secretary	$2.91	$2.68		$2.90	$390	$4,134	$4,524	$520	8.7
Child Care Assistant	$2.50	$2.65		$2.65	$520	$5,512	$6,032	none	never
Arts and Science Division Horticulture	$3.64	$3.22		$3.50	$780	$8,268	$9,048	$1,760	5.1

Notes:

1. Based on annual follow-up study and reported wages by graduates.

2. Based on South Carolina Employment Security Commission 1978 data for Greenville/Spartanburg Area.

3. Based on estimated cost of $89.75 tuition (in-county) and $40.25 other expenses (books, uniforms, etc.) per quarter

4. Based on minimum wage ($2.65) which mught have been earned if not in school.

5. Difference is estimated yearly wage less minimum wage in dollars and years factor to "pay back" education expense.

SAMPLE FORMAT

STATE SUPPLY VERSUS DEMAND PROJECTIONS

SPARTANBURG TECHNICAL COLLEGE CURRENT PROGRAMS

STATE SUPPLY VS. DEMAND PROJECTION 1979 and 1982

(source FY-79 - South Carolina Plan for Vocational-Technical Education)

PROGRAM (by Division)	1979				1982			
	Demand	Supply			Demand	Supply		
		Tec	Other	Total		Tec	Other	Total
Allied Health Division	-	-	-	-	-	-	-	-
Dental Assistant	120	104	5	109	120	122	6	128
Medical Lab Technician	160	153	0	153	160	165	0	165
Radiologic Technician	90	64	0	64	90	60	0	60
Surgical Technician	60	65	0	65	60	76	4	80
Ward Secretary	Note 4							
Child Care Assistant	860	52	91	143	860	63	100	163
ARTS AND SCIENCE DIVISION	-	-	-	-	-	-	-	-
Horticulture	650	79	128	207	650	87	153	240

Notes:

1. Demand for new employees calculated based on economic growth of job area and potential loss due to death and retirement. Impact of job change of employees not included. Total five year demand projections divided into equal increments to show projected annual demand. Actual growth expected to be irregular.

2. Supply estimates based on graduate for Vocational-Technical programs. TEC indicates graduates from states sixteen technical colleges. Other indicates graduates from Voc-Tec high school, Federal/CETA, and private school graduates.

3. Programs are certificate, diploma, or degree programs currently offered by Spartanburg TEC.

4. Ward Secretary not listed in State Plan. Overall projections for clerical field are expected to show greatest relative growth within the State. (increase of 19% with 31,000 position openings in five years). Stenographic field projects a demand of 3,580 annually with a supply of 700-800 graduates per year.

EXAMPLE

OF

PROGRAM ENROLLMENT DATA FORMS

INSTRUCTIONS

PROGRAM ENROLLMENT DATA FORM - NEW STUDENTS

1. Program: Enter name of certificate, diploma or degree program

2. Apply: Enter number of official applications received for program

3. Enroll: Enter number of students enrolled who are new to this program (includes transfers from other programs.)

4. Seats: Enter maximum number of vacancies for new students in the program.

SPARTANBURG TECHNICAL COLLEGE

PROGRAM ENROLLMENT DATA - NEW STUDENTS

SCHOOL YEAR_____

PROGRAM	FALL QUARTER			WINTER QUARTER			SPRING QUARTER			SUMMER QUARTER		
	APPLY	ENROLL	SEATS	APPLY	ENROLL	SEATS	APPLY	ENROLL	SEATS	APPLY	ENROLL	SEATS

INSTRUCTIONS:

QUARTERLY PROGRAM ENROLLMENT DATA FORM

1. Quarter - enter current quarter

2. School year - enter current school year

3. Program - Enter name of certificate, diploma or degree program

4. Number starting pevious quarter - Enter the number from "Total Starting Quarter" column on last quarter

5. Number ending previous quarter - Enter the number of students still officially enrolled at last day of previous quarter (Note: for programs with "open entry/open exit"consider only students who are enrolled at beginning of the previous quarter. Program completion during quarter will be included as if still enrolled)

6. Number Program Completions - Enter number of students completing graduation requirements at the end of or during the previous quarter.

7. Potential Re-enrolling Students - Enter difference between number ending previous quarter and number program completions.

8. Actual Re-enrolling Students - Enter number of students who actually re-enroll from the "potential group. Students whohave had a break in enrollment will be indicated as new students except for the summer quarter. Fall quarter reports will be adjusted to include re-enrolling Spring quarter students as if enrollment was continuous.

9. New Students: Enter new enrollments for current quarter.

10. Total Starting Current Quarter: Enter total of re-enrolling and new students.

11. Total Students by Year: Enter number of first or second year of two year programs.

NOTE: Will be prepared by tenth school day of each new quarter

SPARTANBURG TECHNICAL COLLEGE

QUARTERLY PROGRAM ENROLLMENT DATA

QUARTER_____ SCHOOL YEAR_____

PROGRAM	NUMBER STARTING PREVIOUS QUARTER	NUMBER ENDING PREVIOUS QUARTER	NUMBER PROGRAM COMPLETIONS	POTENTIAL RE-ENROLLING STUDENTS	ACTUAL RE-ENROLLING STUDENTS	NEW STUDENTS	TOTAL STARTING CURRENT QUARTER	TOTAL STUDENT BY YEAR	
								1st year	2nd year

INDEX

	Page
Introduction	1
Categories	
The Need Assessment Model	3
Categories of Data	10
Suggested Criteria	22
Tailoring the Model	27
APPENDIX	
Information and Decision Theory and its Relationship to Need Assessment	39
Example - Program/DOT Job Title Inventory	66
Example - Employers Program Need Survey Questionnaire	70
Example - Community Survey Questionnaire	77
Example - Student Interest Survey Questionnaire	85
Example - Job-Order Accounting Forms	89
Example - Local Supply and Demand Experience-Graduate Follow Data	94
Example - Student Cost Benefit Analysis	97
Example - State Supply Versus Demand Projections	100
Example - Program Enrollment Data Forms	103

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